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The DRILLER

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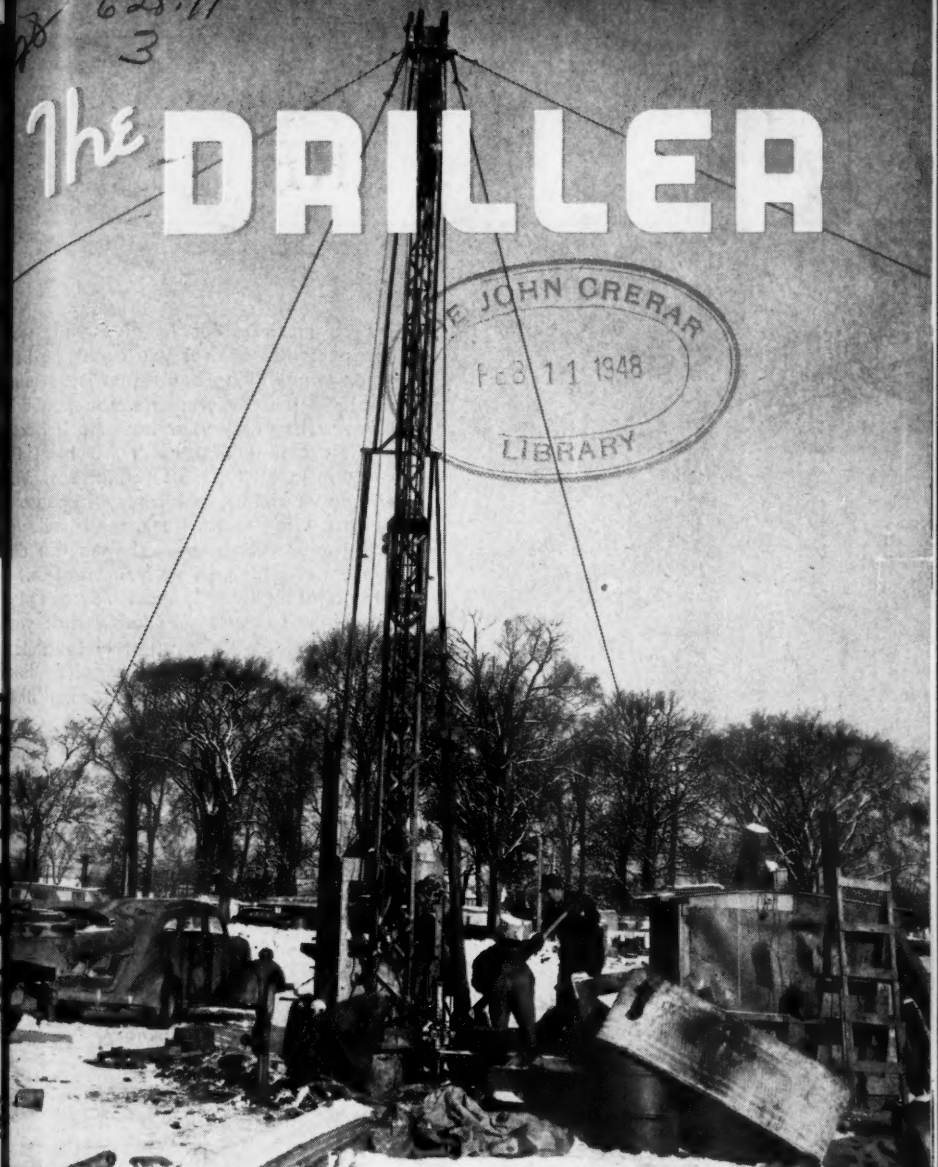

'A Tough Pull . . .'

But the drillers for the Milaeger Drilling Co., Milwaukee, Wis., managed to get this 16-inch casing started with the aid of jacks. The well, drilled for a trailer camp, was down 203 feet at the time.

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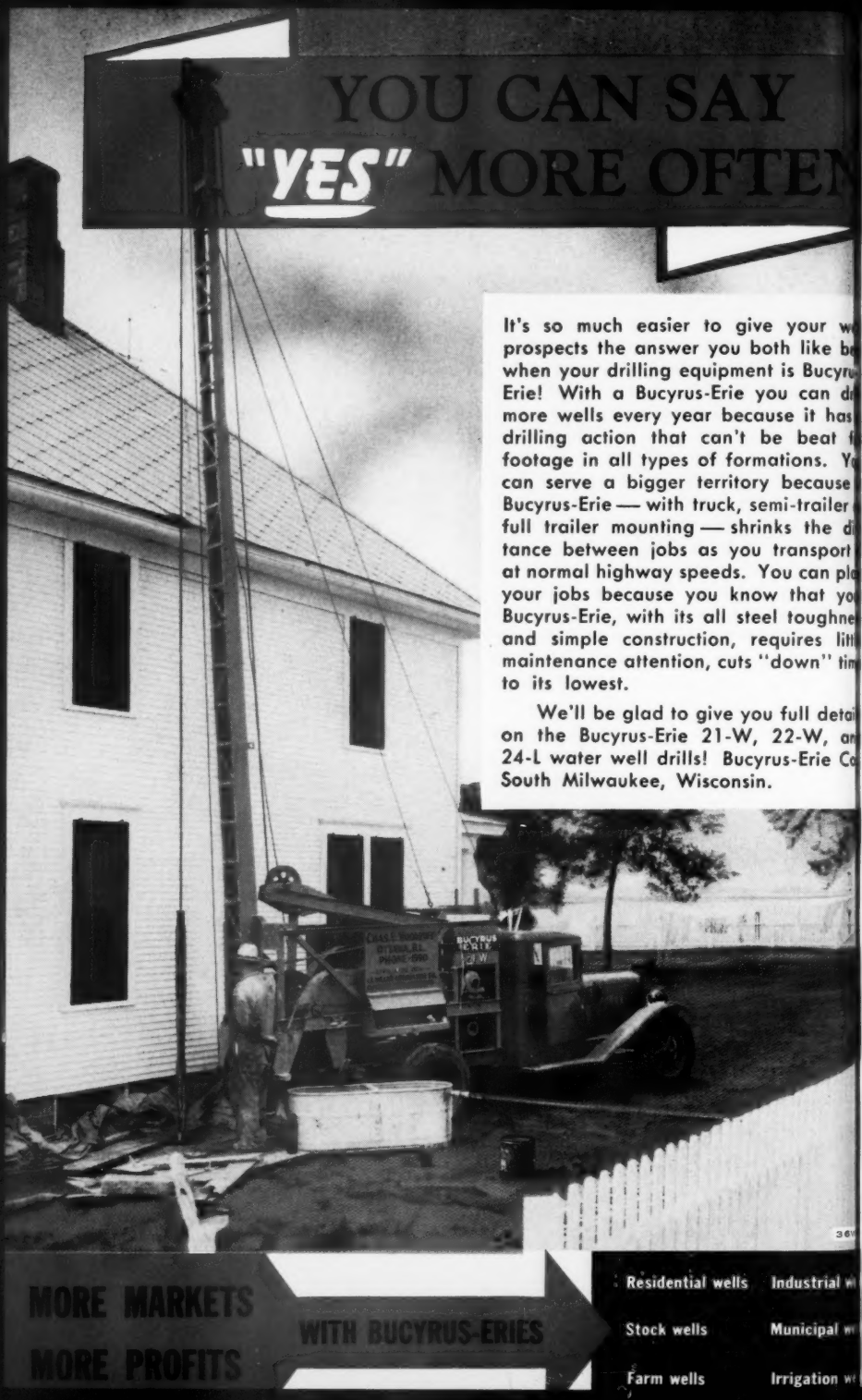
LUME 22 FEBRUARY, 1948 NUMBER 2

DRILLER
U. S. POSTAGE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It's so much easier to give your w
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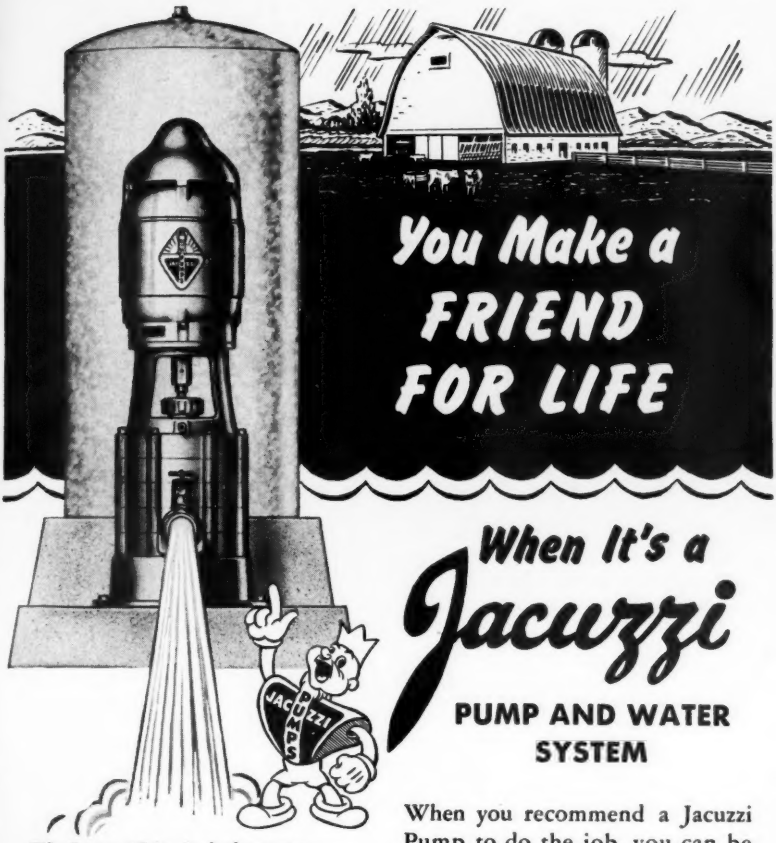

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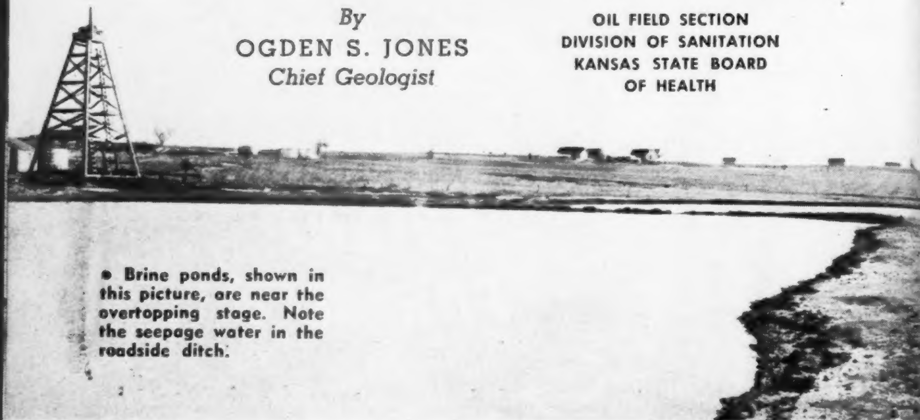
Pumps for Deep and Shallow Wells
RICHMOND, CALIFORNIA
PLANT ALSO AT ST. LOUIS, MO.

ORIGINATORS OF INJECTOR TYPE PUMPS

Brine Contamination OF FRESH WATERS

By
OGDEN S. JONES
Chief Geologist

OIL FIELD SECTION
DIVISION OF SANITATION
KANSAS STATE BOARD
OF HEALTH



• Brine ponds, shown in this picture, are near the overtopping stage. Note the seepage water in the roadside ditch.

WHAT to do with brine or salt water occurring as a by-product of the Nation's oil drilling activities has for years been a difficult problem. It is a problem which is seriously regarded especially by state and local officials charged with the protection of fresh waters from pollution.

The plains states are not only situated in a hard water belt but seldom during the years have they had an over-abundance of usable surface or ground waters. The accumulative effects of industrial expansion, war plants, population increases and dry, hot summers, with consequent accelerated evaporation rates, have placed a premium on the water supplies. Fresh water is one of our ranking natural resources and water can conceivably be the controlling factor to economic growth and industrial expansion. It is, therefore, increasingly evident that the protection of this vital resource from pollution should be of concern to all of us. Farms and municipalities have a right to expect their respective water sheds to be kept free from contamination. Farms and cities have an economic life expectancy of a much longer duration than an oil field. It is, therefore, unjust to allow that expectancy to be jeopardized by the improper handling of oil field brines.

The water well driller is in a strategic position to stress water conservation and point out the danger of allowing fresh water supplies to be contaminated by the careless handling of industrial wastes. This article concerns the serious problem of the pollution of water resources by oil field brine, common to many states, and the preventive measures taken by the state of Kansas.

The problem of oil field brine disposal reached a climax a few years prior to 1935 in Kansas. In order to safeguard underground water supplies from oilfield contamination, the state legislature passed preventive measures which said in part:

"RULE I. It shall be the duty of the Division of Sanitation of the State Board of Health to conduct investigations and field surveys to determine the source and amount of all oil field wastes, including mineralized and otherwise modified waters produced with petroleum in Kansas; to investigate methods for the disposal of such wastes; and to make recommendations for this disposal in such manner as to prevent or reduce, insofar as possible, the pollution of the natural fresh water resources of the state."

Seaboard oil fields do not face the same brine disposal problem as do the fields located in the interior of the country. Brines produced along the coasts may be dumped into the oceans or gulf provided no oily waste is allowed to accumulate on the shores and, in particular, along bathing beaches. The interior of the country has no such receiving reservoir to use for excess brines but must handle them in a manner that will not constitute a hazard to the fresh water supplies. When a highly concentrated brine comes into contact with a potable water, the fresh water

• **A neat brine disposal installation.**

• **This careless type of oil and brine disposal creates a constant threat to underground fresh water reservoirs.**

is always the loser. To keep this contact from taking place, due to the improper handling of oil field brines, is the crux of the problem.

We are accustomed to thinking of sea water as the "briney deep," and when the drill bit goes into salt water, the drillers say, "we have hit the ocean." However, sea water with its 20,000 parts per million of chlorides is fairly mild as compared to some of the oil field brines of more than six times the above concentration of chlorides. In total solids, sea water may average some 35,000 parts per million as against some oil field brines with a concentration of 248,000 parts per million, or over seven times as much.

Brine Concentration

An oil field brine of 248,000 parts per million in total solids is a concentration of 248 times the total solid maximum recommended by the United States Public Health Service for standard drinking water. The amount of chloride free water, in amounts necessary to reduce by dilution the highly concentrated brine to the drinking water standard, would run into large figures. For example, it would require 400 barrels of chloride free water to dilute one barrel of brine of 100,000 parts per million of chloride content down to 250 parts per million, the maximum amount for drinking water as set up by the United States Public Health Service. Keeping this 400 to 1 ratio in mind, figure how many barrels of fresh water would be needed to reduce 10,000 barrels of the above brine to potable water. It would mean diverting 4,000,000 barrels of fresh water or 168,000,000 gallons, which is no mean water supply.

Strange as it seems, salt water wells were in operation in this country as early as 1800, some 59 years before the Colonel Drake oil well was brought in. The salt well operators were quite disgusted at the appearance of oil in some of their operations. Not knowing what to do with it, they often moved to new locations to get away from what they called a "messy nuisance."

Salt water was, therefore, the goal of the early drillers and oil was the waste problem. Now, however, the problem of waste is reversed in that oil is the goal and salt water the problem child. The early operators, in their wild search for the liquid gold, gave no thought to the brine often encountered. Likewise, landowners were so excited over the prospects of royalty payments and lease rentals, that the operator could put the excess salt water any place as far as they were concerned.

Even with signs pointing to the harmful practices of allowing salt water to enter the drainage, little if any, complaint was lodged against the oil operator. Land was cheap and if the water supply turned salty at one place, the farmer had only to move west.

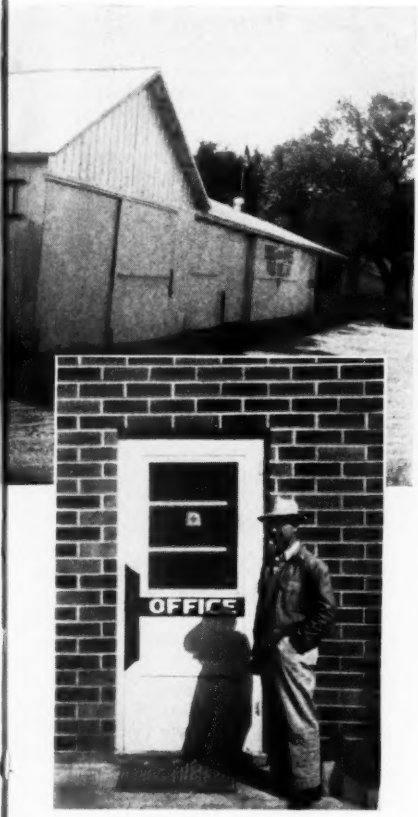
Problem Grows Acute

It was years before the problem became acute. As towns outgrew the early water supplies, consisting predominantly of wells, and turned to more abundant sources, attention was called to the condition of the streams. The day of uncontrolled liquid wastes, produced by the oil industry, was approaching the time when municipalities took notice of the condition of streams. Farmers and city officials began to scrutinize oil operations and, in particular, the manner in which the disposal of salt water was handled.

Following the era of uncontrolled brine discharge, the salt water pond was put into use as a means of keeping the mineralized water out of the drainage. It was soon evident that

(Continued on page 20)

When the Going Gets Tough—
Call Ames



It takes a lot of sweat, determination, and know-how to become a first class driller—and this is just the formula that the Hoeg & Ames Drilling Company of Lincoln, Iowa, have followed for over 40 years in becoming outstanding drilling contractors in their area.

• (Above left) Shown is just one side of the spacious establishment of Hoeg & Ames which extends back many yards to the left. (Left) Sylvan Ames is snapped standing outside his office entrance.

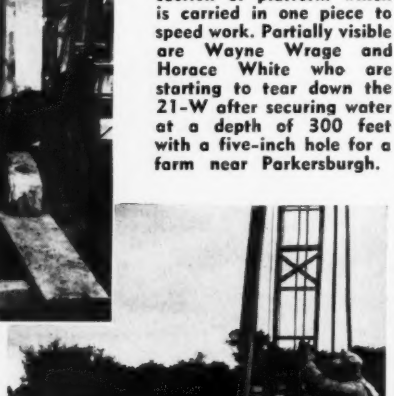
THE people of Wellsburg, Iowa, may have been a little surprised one morning when they noticed the derrick of a water well drill sticking up through the roof of their town pump house. But to those who know Sylvan Ames of the Hoeg & Ames Drilling Company, Lincoln, Iowa, this drilling maneuver would cause little comment. They're used to seeing the Ames boy successfully handle his drilling jobs under other than favorable circumstances.

This Wellsburg job called for the recasing of the town well located in the pump house. So Ames ran his rig into the building, cut a hole in the roof, rigged up his derrick, and went right to work. Just like that.

Sylvan's drilling acumen was learned the hard way—"sweating out" the various drilling problems

• In order to recase a well inside the power plant building at Ackley, Iowa, Ames found it necessary to set his rig up as pictured.

• (Left) This shot shows the circle jack bolted on a section of platform which is carried in one piece to speed work. Partially visible are Wayne Wrage and Horace White who are starting to tear down the 21-W after securing water at a depth of 300 feet with a five-inch hole for a farm near Parkersburgh.



• (Right) Ervol Finch was down 110 feet with this five-inch home well on the outskirts of Waterloo when this picture was taken. Besides the rig, a 33-W, part of Ames' station wagon can be seen in the background.

right on the job. His stepfather, William Hoeg, was responsible for Ames' start. A real drilling pioneer, Mr. Hoeg was in the business 40 years, working an old Ferguson rig with a manila rope and a one-cylinder gasoline engine. It was some 23 years ago that Sylvan began helping his dad on this rig and absorbing the lore of the game. Sylvan's brother, LeRoy, also worked along, and in 1935, the boys formed a partnership with their stepfather, giving the firm its official name of Hoeg & Ames. Though Mr. Hoeg passed away in 1938, his name is still retained by the firm in his memory. Just two years ago, LeRoy Ames went into business for himself in the Humbolt, Minnesota, region, leaving the original firm in Sylvan's capable hands.

At present, Ames has five rigs working in a territory that covers roughly a 50-mile radius around his home town of Lincoln. The drilling equipment is all Bucyrus-Erie, consisting of three 22-W's, one 33-W, and one 24-L. The 24-L is kept busy on metropolitan work such as air-conditioning, industrial, and creamery wells, while the other rigs are assigned to farm and residential wells plus what little prospecting work is done for dams.

These smaller rigs account for about 75% of Ames' work. The Iowan also has drilled piling holes for the University of Iowa, putting down 50 ten-inch holes which were later filled with concrete and steel rods to form a solid base for the university power house.

What Sylvan believes to be the deepest farm well in Iowa was put down with his 24-L for a farm located 15 miles northeast of Marshalltown. The well, drilled to 1745 feet in depth, was started at six inches in diameter and finished at 3¾ inches in New Richmond Sandstone. The casing log figures showed that 304 feet of six-inch casing were

first put in; this was followed with 200 feet of five-inch casing; then 435 feet of 4¼-inch pipe was set in shale. The well was finished with 172 feet of 3¼ inch set at 1605 feet in St. Peter limestone. Static water level of the well was 185 feet.

Though this was the deepest farm well Sylvan has put down, his deepest well of all types was a 2413-footer drilled with his 22-W for the Nevada Poultry Company of Nevada, Iowa. This whopper, which was started at ten inches and finished at 4¼ inches, had a static water level of 122 feet.

Big Producer

Another job that brings a smile of satisfaction to Ames' face is the Story City town well No. 2 which was artesian and tops for water production in that area. The well was drilled 12 inches in diameter to a depth of 132 feet and ten inches the remaining distance to 261 feet. Though the natural flow from the well was 450 Gpm., it produced 660 Gpm. when tested, having an eight-foot drawdown. After regular pumping equipment was installed, a production of 750 Gpm. was gauged.

With his five rigs working constantly, Ames was able to punch down 202 wells during the past 12 months. Besides himself, Ames' crew is composed of eleven men and a girl stenographer. Two of the men do nothing but install and service pumping equipment and water systems. Ames is a distributor for Fairbanks-Morse Company.

• Down 300 feet with a five-inch hole, Homer Rhodes is pictured with a Hoeg & Ames 22-W on a farm job located five miles northwest of Dike, Iowa. Rhodes has been an employee of the Ames organization for ten years.

• This flow of water comes from an 800-foot well for the town of Danville, Iowa. The well is being test pumped.

The Iowan's sprawling and well-planned building encloses a neat office, warehouse, garage, and workshop. In the workshop is a No. 8 Bucyrus-Erie bit dresser which is used to sharpen all of the bits the firm uses. Bit sizes range from 4¼ to 16 inches in diameter. The Ames drillers used the color method for determining steel heat and quench the bits in water. Sylvan also has his own fishing tools plus a large variety

(Continued on page 18)

The DRILLER

A JOURNAL FOR WATER WELL DRILLERS

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Water Tables Low In Eastern States

NEW ENGLAND States continued to suffer from the depleted ground-water reserves during the month of November, according to the monthly water report issued by the U. S. Geological Survey. Though there were small rises in ground-water levels tabulated in Maine, many farmers were still forced to haul water from lakes and ponds for domestic use. With ground water levels far below normal at the end of the month, December's outlook was not favorable.

Heavy precipitation in the southern states boosted underground water levels to the high point in some sections. In North Carolina, key ground water wells showed a marked recovery as a result of fall rains, but levels remained below normal in the western part of the state.

New Mexico Report

In New Mexico areas where ground water is used for irrigation, levels changed only slightly during the month, owing to partial cessation of pumping at the end of the irrigation season, the bulletin states. The net decrease for the year is considerably greater than for the year ended November, 1946, partially due to increased pumping in 1947 brought about by the drought. Departures from average are becoming increasingly larger, the report continues, because of the continued removal of water from underground reservoirs. Ground water levels in Santa Barbara County, California, remained about the same or showed local slight declines because of the lack of rainfall during the month and local, intermittent pumping.

Edgar W. Cain
1876-1947

Drillers in the Eastern States were recently saddened to learn of the death of Edgar W. Cain, 71, who passed away at the Somerset Hospital, Somerville, N. J., December 29, 1947.

Mr. Cain, who resided in Bellemead, N. J., served his community for 35 years as a well contractor and was prominently known throughout northern New Jersey. During his successful drilling career, he made a host of friends both within and outside the industry. He is survived by his widow, Aldona, and seven children.

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A definite need for two types of jet pumps and water systems—one designed for shallow wells—the other designed for deep wells—is met by the two Deming Jet Systems illustrated.

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Figure 4902. 200 to 4500 gallons per hour.

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NEWS OF THE MONTH

Iowa Association Sets Meet Dates

THE annual convention of the Iowa Well Drillers Association will be held February 18, 19, and 20 in Fort Dodge, Warden Hotel, according to Secretary Sylvan R. Ames. Final details for the convention program are being worked out at the present time.

Texas Directors Hold Meeting This Month

ARTICLES of incorporation were read at the first annual meeting of the Texas Water Well Drilling Contractor's Association held December 6, 1948, in Houston Texas, accordng to A. E. Fawcette, Jr., President.

An open discussion on the pipe situation featured the meeting and resulted in a resolution authorizing the president of the association to write Texas Senators regarding the matter. Each member was also individually authorized to write senate members in view of the fact that congress may vote on the government allocation of steel.

It was also decided that the board of directors should meet February 15 to discuss the legislation for underground water regulations scheduled to be introduced in the State of Texas.

The following committees were apponted by President Fawcette: Education Information—Fuller, Patton, and Kuhlman; Legislation—Bowles, Lowery, Longuire, and McCowan; Ethics and Practice—Hardin, Holt, and Fawcette, Jr.; Finance—Jenson, Swinehart, and Davis; Publicity—McGowan, Fawcette, Sr., and Bowles.

Missouri Drillers To Meet In Rolla

ANNOUNCEMENT has been made of the intention of the Missouri Water Well Drillers Association to hold its annual meeting in the Buehler Building, Missouri School of Mines at Rolla, April 12 and 13, 1948. Service Secretary Keith Anderson, who is in charge of program plans and arrangements, will make known the complete program at a later date.

Gophers Announce February Meeting

Word has been received of the intention of the Minnesota Well Drillers Association to hold its annual convention in Minneapolis on February 24, 25, and 26 at Hotel Dyckman. The program committee is busily engaged in arranging plans for the three-day meet.

Report Survey of South Carolina Ground Water

SOUTH CAROLINA generally has an adequate supply of good quality ground water, according to an announcement by Robert M. Cooper, director of the State Research and Development Board, based on recent ground water investigations.

The report of G. E. Siple, Water

resources Branch of the U. S. Geological Survey of the Department of the Interior, which showed that the coastal plain section of the state has more ground water than the Piedmont, went on to state: "The quality of water in the Piedmont province compares rather favorably with that of other sections of the country, except for occasional hard waters."

Industries Use Water

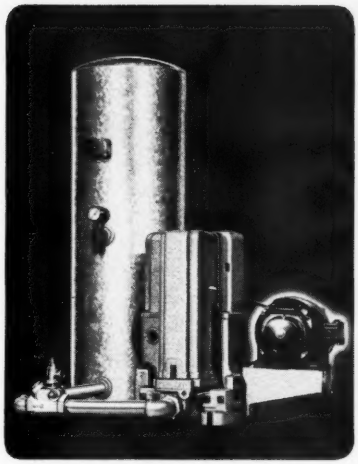
Coastal Plain water likewise was termed generally good, except for hardness in municipal supplies in the lower triangular section of the state and the presence of chlorides and fluorides near the coast.

Siple found that 115 of the 166 municipalities in South Carolina having public water supplies use ground water, and that approximately 98 per cent of the state's rural population obtained water from wells. He reported also that "a large part of the industrial plants" use ground water.

The report disclosed that Coastal Plain wells generally yield much more water than Piedmont wells. Some coastal section wells yield as high as 2,000 gallons a minute, although most yield from 200 to 600 gallons a minute. Wells in the Piedmont generally range from 50 to 100 gallons a minute in production with some producing as much as 300 gallons a minute.

Beef Goes Down! Not Price Though

MAYBE well drillers will be able to ascribe another attribute to the value of well water when they learn of the heifer which spent five weeks in an abandoned well on an Iowa farm and lived to "moo" the story. Frank Venning, a farmer living north of Keokuk, Iowa, stated that when a neighbor moved cattle from the Venning farm, the



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heifer apparently fell into the old well. It wasn't until five weeks after the incident that Venning dscovered the cow and rescued her.

It's On The City

THE 700 villagers of Illiopolis, Illinois, were presented with an opportunity to drink water from their own wells for the first time since the last war.

When excessive water demands of a nearby war industry caused the Illiopolis well to run dry, the town began buying its water from the government which had put down eight wells of its own on the ordnance plant project. Two of the wells, located less than two miles from the town, were offered for sale by the War Assets Administration. Naturally, the town is the only probable purchaser.

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Wisconsin Record?

• What may be the deepest water well in Wisconsin was recently drilled for the city of Wauwatosa by Layne-Northwest with their 36-L. The hole was started at 26 inches in diameter and finished at 19 inches at a depth of 1700 feet.

Major Industries Of Hoosier Town Finance Wells

THREE major industries of Connersville, Indiana, have advanced funds to the city to expedite the drilling of three additional wells and installaton of two new pumps for the city water works. Drilling started December 8.

Lack of sufficient city funds to adequately maintain water supply for a 100% increase in manufacturing in the city over a period of a year, caused the water plant capacity to be overtaxed. Adding to the gravity of the situation, three of the city's nine wells went dry. The remaining six wells have been supplying 2,250,000 gallons of water daily, in the face of a demand for more than 3,500,000 gallons daily.

Of the thirteen wells that have been drilled by the city since 1939,

three were drilled within the last year and a half. The American Central Division of Avco, one of the three large manufacturing plants recently forced to close because of water shortage, is drilling two wells for the city and is installing a complete new pump. This company is demanding an increase in the water rates as a means of providing sufficient funds for maintenance and expansion of the city's water system. The company pays an annual water bill of $15,000.

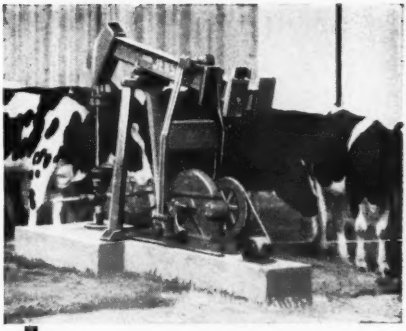
The Rex Manufacturing Company, Inc., and the Stant Manufacturing Co., other Connersville industries, are assisting the city with funds in the financing of a new well.

Clogged Systems Made To Behave

CONSULTING engineers and chemists apparently have won a four-cornered battle to make the water supply system at the Neville Company plant in Pittsburgh "behave."

A year ago, slime and other organic growths from the two wells owned by this coal tar byproducts firm choked up the plant piping so effectively that shutdowns occurred every few days. To lick that trouble, a chlorinator was installed—but manganese in the water promptly fouled the chlorinator's working parts, so that the slime-clogging of water lines continued.

A newly developed chemcal then was called in to aid the chlorinator by making the manganese stay in solution rather than precipitate in the chlorinator. The newcomer, a phosphate glass material known as "Micromet" and produced by Calgon, Inc., Pittsburgh, stabilizes the manganese so that it allows the chlorinator to function properly.



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FROM THE MAILBAG

This page is open to any of our readers having questions to ask relating to drilling, driving pipe, dressing bits, etc. All letters will be answered promptly by experienced drillers and engineers who are qualified to give intelligent advice on these subjects. We will publish as many letters of general interest as space will permit. Address: The Driller, South Milwaukee, Wis.

Water Wells Develope Crude Oil Taste

Dear Sirs:

About nine months ago, we drilled four wells about 100 feet apart for a building corporation. The wells average 74 to 96 feet in depth. In a short time there developed a crude oil odor in the water. Upon draining one of the water systems, we obtained almost a quart of pure crude oil.

Some 55 years ago there were several oil wells drilled in this location, ranging from 1800 to 2500 feet in depth. These wells were never plugged or sealed because the Ohio law did not require it at that time. Of the two of these oil wells that are located at either end of this location, one produced 600 to 800 barrels every 24 hours for a short period.

We would appreciate any advice or remedy you could give us concerning this trouble.

E. C. B. Ohio

We note the water wells range in depths of 74′ to 96′ and that about 55 years ago there were several oil wells drilled in the same area ranging from 1800 to 2500′ in depth, which wells were neither plugged nor sealed at the time they were abandoned since the Ohio laws did not require dong so at that tme.

Doubtless these oil wells were cased and after so many years the casing has rusted through, permitting the stored oil to escape through the cracks and crevices in the formation and thus enter the ground water.

Reply Difficult

Without knowing the local geology it is, of course, difficult to make a satisfactory reply. If the well is in limestone, the oil might descend through cracks and crevices to a considerable depth. If the rock is exceedingly free from joints and the well is cased and properly sealed the oil would have difficulty, of course, in entering the casing. It is quite likely if the well were cased through a shale or hardpan bed into a water bearing formation below, there would be little danger of trouble with the oil. On the other hand, if

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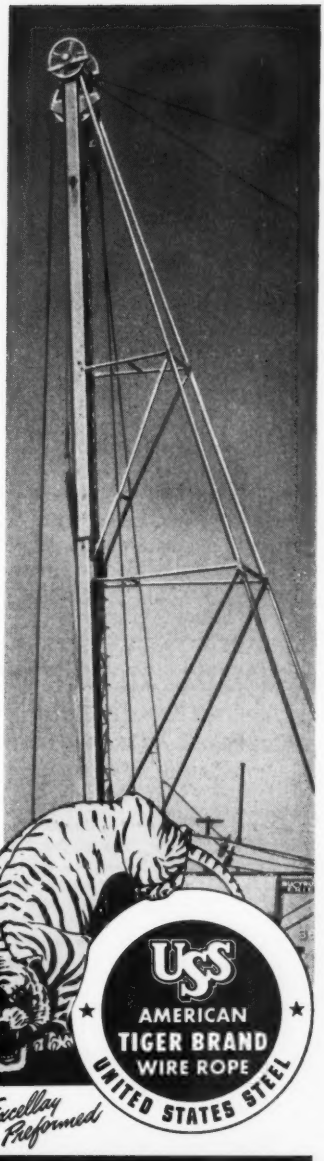
● And, it's easy to see why . . . because U·S·S American TIGER BRAND Mor-Spring Wire Lines are developed especially for shallow hole drilling. The extra spring built into these lines means greater "reach" and better action of drilling tools. They help you get down faster . . . and stand up longer . . . mean less time out for repairs and replacements—factors that pay off in more hole per day . . . more profit per well. Ask your supplier for these superior lines. See for yourself why the big demand is for TIGER BRAND.

Immediate Delivery

See or call your supplier



AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York
UNITED STATES STEEL

U·S·S American TIGER BRAND MOR-SPRING WIRE LINE

the surface material is more or less porous glacial drift and there is nothing much different for a considerable depth, we do not see how the well can be protected by well repairs.

We suggest you also write your State Geologist for his opinion as to how this situation may be remedied to assure a safe water supply.

Call Ames . . .

(Continued from page 9)

of equipment including welding apparatus.

For servicing operations, Ames has a 2½-ton truck for moving equipment and a carry-all pick-up truck. When necessary, the Ford station wagon that Sylvan roams the countryside in can be pressed into service for hauling small parts. It perhaps might be a good idea to list the new Stinson four-seater he flies when jaunts between jobs are rather long. Being air-minded, Ames admits that sometimes the jaunts don't have to be *too* long before he climbs into the pilot's seat. This air travel has served him well during the casing shortage when it was necessary to make a few good-sized trips to arrange for deliveries. He also adds that some customers appear to be as much interested in getting a plane ride as they are getting their wells drilled.

"There seems to be a little of everything in this territory," Sylvan remarked when questioned about the types of formations he encounters. In some places, he has to go 400 feet before hitting rock, while around the Waterloo area, rock can be found around 30 to 40 feet below the earth's surface. Formations can change rather abruptly in some areas also. For example, after putting down that deep 1745-foot farm well mentioned earlier in the story, Ames was able to get a good well some 1400 feet away at a depth of only 132 feet!

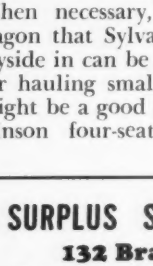
Boulders Difficult

The Ames drillers' biggest difficulty is the numerous boulders encountered in certain formations. Their method of solving this problem is simple and time-tested—they blast their way through. However, the boys have picked up a successful trick for keeping the hole in line while drilling in these formations. They find that by drilling with long sinker bars, the hole does not have much chance to wander off. Another drilling "kink" that the Iowan has picked up during his career applies to the saving of time in rigging-up. The drilling platforms are carried in sections with the circle jacks already bolted into place, saving time and lessening the possibility of losing equipment.

Sylvan always stresses to his men

SURPLUS STOCK SALE!

132 Brand New
Gearand Wheel Pullers



Popular Size
Model No. 1004.

The harder the pull, the tighter the arms hug the work. Made of heavy one-piece forged steel yoke. Heat treated forged steel arms and straps. Will take gears, wheels, etc., up to 18" in diameter.

Diameter .....18"
Reach .....15½"
Diameter, Screw .....1¼"
Length, Screw .....16"
Hole adjustment .....3 hole
Weight .....40 lbs.

Bargain Price $22 ea. F.O.B. South Milwaukee

Bucyrus-Erie Co.
South Milwaukee, Wis.

the importance of keeping alert on the job. This has been a big factor in the small number of fishing jobs that the Ames boys have had. On one occasion, with a new set of jars being used on one of the rigs, a crack developed in the jars. Being on their toes, the men quickly noticed the defect and changed the jars. "This alertness probably saved us from fishing for an entire string of tools," Ames remarked.

Drillers Well Trained

The drilling organization of Ames' is both well trained and well managed. Responsibility is fostered because helpers are used only on the larger jobs. On the smaller farm wells, two men set up the job, but once the rigging is completed, one man takes over while the other is assigned to a job elsewhere.

Though winters are sometimes severe in Iowa, Hoeg & Ames manages to drill throughout the year. During these wintry months, "doghouses" are added to each job to shelter the drill operators. The spring season also can prove difficult when rains turn dirt roads into the well-known "Iowa Gumbo." It goes without saying that attempting to move a rig under these conditions can prove very trying.

Though Sylvan has a large backlog of well orders to fill, he pursues a progressive advertising policy, advertising daily in the Marshalltown paper, besides inserting regular ads in a municipal magazine.

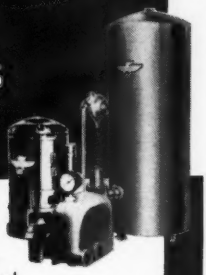
Huskers Convene

THE annual convention of the Nebraska Well Drillers Association was scheduled for Nebraska Hall, University of Nebraska, in Lincoln on January 28-29, according to word received from G. S. Brinton, chairman.

"The Choice that Makes Friends"

RED JACKET

for everything in PUMPS AND WATER SYSTEMS



There is every indication that 1948 will emerge as a year of great opportunity for well drillers who sell Red Jacket Pumps and Water Systems. The large number of people who are waiting for automatic water systems will welcome this 70 year old name in pumping equipment. Increase your sales and profits with a complete line backed up by Red Jacket's comprehensive national advertising campaign and aggressive promotion.

HAND AND WINDMILL PUMPS

Red Jacket's reputation was established many years ago with these famous pumps. Many of the originals are still in use. Repair parts are still being furnished for pumps built over 40 years ago. Capitalize on this reputation for quality and service. It will pay you dividends in an ever increasing number of satisfied customers.

PUMP AND WELL ACCESSORIES

Red Jacket's line of Pump and Well Accessories is complete. Accessories are a valuable part of your business and help you give your customers better service.

Place your order for pumps, water systems and accessories now and join the host of dealers who sell "The Choice That Makes Friends."

RED JACKET water service products

Write today for catalogs of the pumps in which you are interested. Address Dept. D.

RED JACKET MFG. CO.

DAVENPORT • IOWA

Contamination . . .

(Continued from page 6)

the use of earthen storage for liquid wastes led to early contamination of the shallow ground water. Take, for instance, the porous soils which cover much of the surface in the plains states. It has been proved conclusively that all earthen ponds leak to some degree and those constructed in porous soils, to an alarming extent. The leaks occur most readily at the contact between the earth fill and the original ground or directly through the new embankment. However, the most insidious leak is the downward infiltration of the impounded mineral wastes. Certain pollution quickly follows this infiltration in the many instances where no impervious stratum interposes between the surface and the first fresh water.

It was formerly contended that these reservoirs be called evaporation ponds. In the first place, most of them are far too limited in surface area for evaporation to have much effect. Again, evaporation and rainfall so nearly compensate each other in some areas that a few cloudy days each summer month, to say nothing of the winter months, would nullify most of the evaporation. Solar evaporation does not, in another sense, contribute to the solution of the problem because only water vapor is lifted from the pond, thereby perhaps reducing the volume of water, but leaving a more concentrated brine and finally, a residue of total solids. Salt water, you will remember, evaporates at a slower rate than fresh water.

Evaporation of brines by applying heat has been tried in a small way but even with a cheap fuel, the heavy residue of salt presents the problem of what to do with it. For instance, it would take 154,000 cubic feet of 1000 b.t.u. gas to evaporate 400 barrels of water. If this water contained 80,000 parts per million of chlorides, there would be a salt residue of over 11,000 pounds to dispose of at the end of each day's run, which would be both expensive and burdensome.

always remember —
MYERS
builds a
COMPLETE LINE
of Water Systems

Ejecto and Plunger Types for every need. Capacities up to 4500 gallons per hour.
MYERS
THE F. E. MYERS & BRO. CO.
Dept. M-32, Ashland, Ohio

Agencies Cooperate

In order to expedite certain features of the work, the Oil Field Section has found it desirable to enter into cooperative agreements with such agencies as The United States Bureau of Mines; The United States Geological Survey; The Department of Petroleum Engineering at the University of Kansas; and the State Geological Survey. These agencies, with trained technical staffs, have rendered splendid service in gathering factual data. This material is used as an aid in the determination of the disposal policy to be followed in certain areas.

A shallow brine disposal well of

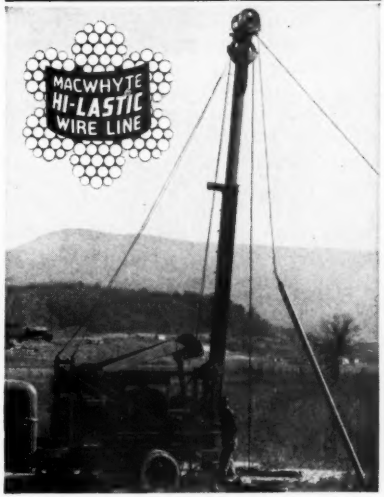
less than 1000 feet in depth may take considerable input water for a time, but later, it may be necessary to step up the injection pressure which adds to the disposal costs. When a porous, deep seated bed is known to be available, it is less costly in the long run to make use of the deeper formation. Several areas in Kansas are using the Arbuckle, a silicious limestone, for disposal purposes. This horizon is often 4500 feet below the surface and, fortunately, it takes immense volumes of water by gravity, with no injection pressures involved. It is readily understood that a column of water 4500 feet in depth exerts considerable pressure (approximately 2000 lbs. per square inch) on the face of the receiving formation. At this point, it may be of interest to note that Kansas has more brine disposal wells than all the other oil states combined.

Deep Well Best

In the early development of underground disposal, most of the wells were of the shallow type, ranging from 400 feet to 1000 feet in depth. As the brine disposal program developed, it became apparent that the shallow well, not only had a relatively short life, but its volume of water intake was sharply limited. The deep disposal wells, contacting beds some 4000 feet below the surface, were receiving favorable comment as to the immense quantities of water they were capable of taking. Another point was that the deep well had but seldom to resort to injection pressure. Some of these last mentioned wells show a potential capacity of 10 to 20 thousand barrels of brine intake per day under actual test.

A small operator or even a major company would not be economically justified in the expenditure neces-

DRILL MORE HOLE AT LESS COST



By enabling tools to strike harder and faster, Macwhyte "Hi-Lastic" Wire Line helps you drill more hole, for less! It allows the tool to drop farther for a given stroke of the machine AND strike a harder blow because "Hi-Lastic" has greater elasticity than ordinary drilling lines.

"Hi-Lastic" adds greater speed to drilling . . . makes possible more strokes per minute...strikes harder blows . . . drills faster . . . lasts longer.

On deep wells, especially more than 1000 feet, drillers use Macwhyte Standard Cable-Tool Lines. These have just the right elasticity to make hole fast.

For Sand Lines, drillers use Macwhyte (6 x 7) Mild Plow Steel.

Get the CORRECT line for your equipment from

NO. 909

MACWHYTE COMPANY

2939 Fourteenth Avenue, Kenosha, Wisconsin, or any authorized Macwhyte Distributor or Mill Depot

sary to install a deep well if only one or two wells were the development limit of a particular lease or field. Therefore, it became evident that due to the volume of water intake shown by the deep well, it would be possible for several operators to form an association and use the same disposal well. Once this was decided upon, it was but a simple matter to prorate the cost on a per well basis. The disposal associations also came into being because of a sincere desire of many companies to protect the fresh water reserves by the use of deep disposal. If they could not afford individual wells, they were willing to join an association of several operators and use one community brine disposal well. Disposal associations are, for the most part, on a non-profit basis.

As many as sixty oil wells often discharge the produced brine into one deep disposal well. Several such disposal wells can conceivably take care of the produced brine of an entire field. If such a field is served by one disposal system, it is quite within expectations to have disposal costs of considerably less than one cent per barrel. We feel that the disposal of brine into deep seated formations, administered by a disposal association, is the logical and economical answer to the brine disposal problem.

Support Needed

Water well drillers dealing in water problems should pass on to the public the necessity for water conservation. State and Federal agencies now engaged in the evaluation of our water reserves should be given additional public support in order to expand the program. In order to plan wisely for future expansion, and accurate inventory of water supplies must be ascertained. Industries, cities and states could do much to create good will by making certain that a usable water goes to their downstream neighbors.

Alert Public Needed

A public that is well versed in water conservation will be more alert as to how water users handle this vital resource. Any concern that in its operations contaminates a water supply will be in the spotlight of adverse criticism and public disapproval. Public good-will can be achieved more readily by those industries that are concerned with maintaining the quality of our water supplies. If conditions do not improve, in the not too far distant future, we may be faced with the necessity of strict control or perhaps proration of water. Water well drillers can do much in advancing to their clients, and to the public in general, the very high place water has in our every day lives and in our very existence.

Quality Means More Dollar Value

COOK

Vertical Turbines
Water Systems
Well Strainers
Water Well Supplies
Octagon Wood Rod

A. D. COOK, Incorporated
Lawrenceberg, Indiana

GIANTS in the world of Water Pumping

Peerless Hydro-Foil MIXED FLOW Pumps

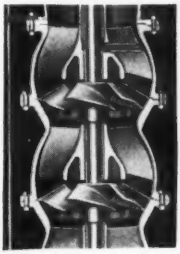
CAPACITIES: UP TO 220,000 G.P.M.
LIFTS: 2 to 60 FEET

Rapidly Move and Remove Vast Volumes of Water Against Low and Medium Heads

Highly successful in the efficient handling of large volumes of water, Peerless Mixed Flow Pumps are being applied to process work, condenser service, liquor and chemical circulation and a variety of industrial services where pumping is desired from open pits, sumps, and surface water sources, such as lakes, rivers, etc. and for large scale dewatering operations.

Peerless has proved the effectiveness of incorporating aero-dynamic streamlining principles to large-volume water lifting, resulting in new conceptions of high efficiences and lower overall pumping and maintenance costs.

Water turbulence accompanying the usual propeller and vane construction, and normally resulting in excess wear, inefficiency and loss of power, are reduced to the minimum in the Peerless Mixed Flow design.



Cutaway view of Mixed Flow multi-stage pump impeller and bowl construction revealing high-efficiency impellers utilized for more economical water lift.

Peerless Propeller Type Pumps

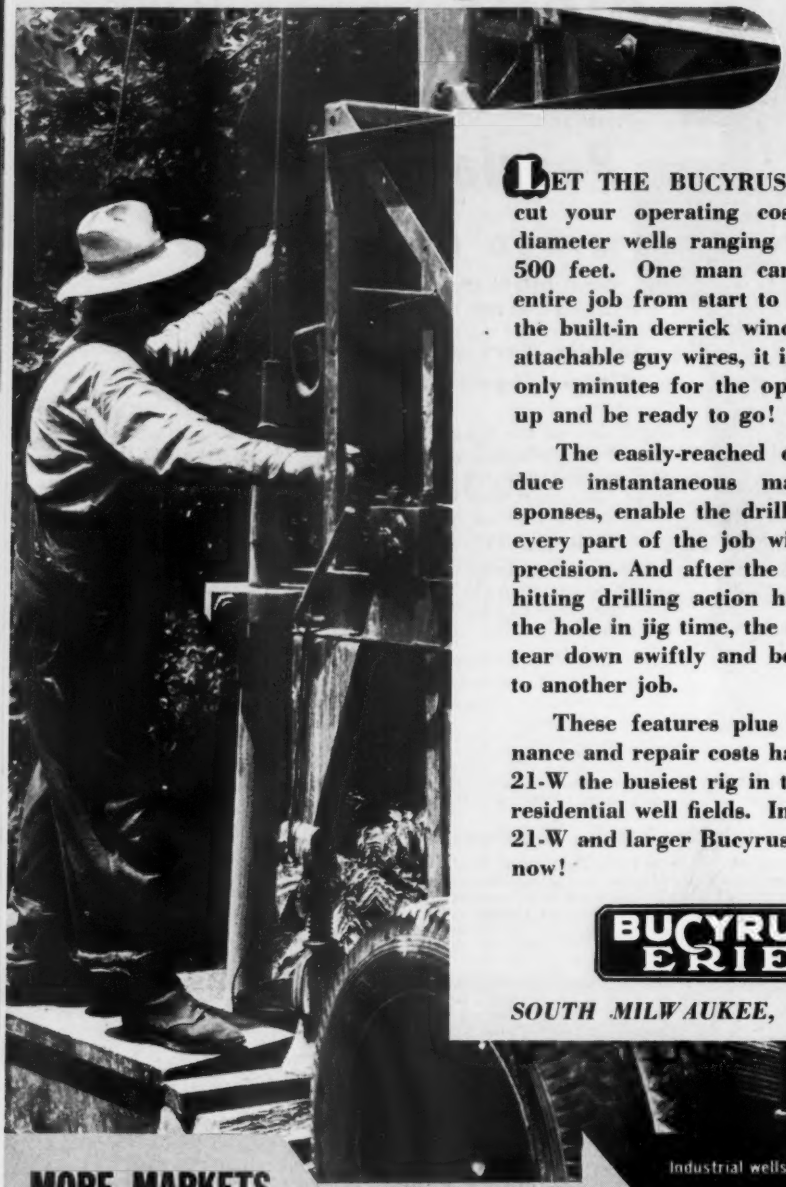
Peerless pumps, embodying the Hydro-Foil principle, are also available in the propeller type and are capable of handling identical capacities of the Peerless Mixed Flow pump. Request Bulletin B-148 completely describing the design, construction and application data of these two outstanding types of Peerless Pumps, for large-volume water pumping.

fmc PEERLESS PUMPS

PEERLESS PUMPS

PEERLESS PUMP DIV. FOOD MACHINERY CORP.
Los Angeles 31, Calif.; Indianapolis, Ind.; Quincy, Ill.
District Offices: Chicago 40, 4554 No. Broadway; Philadelphia Office: Suburban Square, Ardmore, Pa.; Atlanta Office: Rutland Building, Decatur, Georgia; Dallas 1, Texas; Fresno, Calif.; Los Angeles 31, Calif.

ONE MAN OPERATION Cuts Drilling Costs!



LET THE BUCYRUS-ERIE 21-W cut your operating costs on small diameter wells ranging to depths of 500 feet. One man can handle the entire job from start to finish. With the built-in derrick winch and easily attachable guy wires, it is a matter of only minutes for the operator to rig up and be ready to go!

The easily-reached controls produce instantaneous machinery responses, enable the driller to handle every part of the job with snap and precision. And after the 21-W's hard-hitting drilling action has put down the hole in jig time, the operator can tear down swiftly and be on his way to another job.

These features plus low maintenance and repair costs have made the 21-W the busiest rig in the farm and residential well fields. Investigate the 21-W and larger Bucyrus-Erie models now!

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

MORE MARKETS
MORE PROFITS
WITH BUCYRUS-ERIES

Industrial wells | Residential
Farm wells | Municipal
Stock wells | Irrigation

Bargain Counter

All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: 30c per line. Minimum charge $1.20. No discounts; no commissions. Count your own copy to avoid delay. The average line contains 28 characters (20 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number if blind advertisement is desired. Closing date—10th of preceding month. Example — January issue closes December 10th. Be sure to address separate inquiries to each advertiser by using the correct box numbers. Mail Box inquiries care of THE DRILLER, South Milwaukee, Wis.

DRILLS FOR SALE

Marvel all-steel well drill with tools and truck. Write or phone Hamilton Well Drilling Company at Spring Valley, New York. Phone 1060.

Bucyrus-Erie 21-W, mounted on 37 Chev. Truck. New, with 400 ft. cables. Write to Box 224, Lowell Rasmussen, Hettinger, North Dakota.

No. 36 Sullivan Rotary, 4 wheel pneumatic tires trailer mounted, 4 cylinder engine, 4x5 Gardner Denver pump, new hoses, some tools. Good condition. With or without water tank and truck. Reasonable price. Wm. Stewart, 503 Douglas, Sterling, Colorado.

3½ Keystone traction machine, ¾" wire line, new shocks. In good condition, now working, can be easily truck-mounted, very reasonable. Also 2 sets of jars 2½x3½ A.P.I. 7 thread, 10' stem 2½x3½-7, rope sockets 9 and 9½ bits 2½x3½-7, six 9" bits 8x4-7. Make an offer. Located in New Jersey. Box 206

DRILLS FOR SALE

Bucyrus-Erie 33-W, recently overhauled, in perfect condition. Write or telephone W. W. Service Co., 4504 South Whitnall, Cudahy, Wis. Phone Sheridan 0884.

Hydraulic rotary well machine, mounted on Chevrolet truck, with all necessary tools and tank wagon. A-1 condition. Drills two-inch to six-inch well. Tom Ewalt, Geneva, Nebraska.

Bucyrus-Erie 21-W drill equipped with blower, clutch driven casing reel and other extras. Mounted on Chevrolet 1½ ton truck. All in excellent condition. Price f.o.b. Oblong, Illinois, $3,000. Owner: O. F. Culver, Oblong, Illinois.

No. 14 Armstrong drill, mounted on chain drive Packard hard rubber tired truck, in good condition, just finished 416 foot 6" well in 3 weeks drilling time. Ford A motor unit, with roller bearing transmission. With tools for six inch hole, 2 bits, rope socket, stem, chain tighteners, claw wrenches, two tongs with bailer, ⅝" line with ⅜" sand line as is on machine.

Keystone drill all steel mounted for towing on hard rubber. New 40' I-beam steel derrick with Bucyrus shock absorber, double 8" steel spudding beams, 4 cylinder Waukesha Motor with 3 speed transmission and reverse. Machine in excellent shape, just finished 480' well 6" hole with 242 foot of hard driving pipe.

Large No. 25 rebuilt Armstrong drill, mounted hard rubber for towing. Reinforced derrick, Bucyrus-Erie rubber shock absorbers top derrick. Bucyrus cable winder on bull reel. Will handle 2,000 hole easily, with ¾ cable. Minneapolis-Moline Power unit 35 HP roller bearing transmission drive with V-Belts. Asbestos lined brake wheel with reinforced sand reel spooling 2,500 ft. sand line. (Subject to prior sale.) Apply: Gray Well Drilling Co., P. O. 181, Delafield, Wis. Phone 181.

DRILLS FOR SALE

Sanderson-Cyclone wood frame truck mounted, with or without tools, located northeastern Ohio. Box 205

New 71 Speed Star drill. 40 ft. mast, good 2½ ton GMC truck, fine rubber, drilled less than 900 ft. hole, $4,200.

Keystone 1½ drill, 38 ft. steel mast, and frame, rubber shock absorbers, 2½ ton GMC truck, good rubber, will drill to 1,000 ft. 6 inch hole. Buda motor, $2,500. Columbia Pump & Well Co., 232 Gallatin St., N.W., Washington, D. C.

Rotary drills, truck mounted, chain and hydraulic pull down, water trucks, used table and swivel, bits, subs, pipe-1¼", 2", 3", 4", 5". P. O. Box 1832, Casper, Wyo.

33-W Bucyrus-Armstrong drill mounted on Ford V-8 1-½ ton dual rear-tired truck. Complete with 6" tools and 8" bits, ready for immediate operation. Price—$4500. Box 198

Bucyrus-Erie 24-W drill adaptable to water, gas and oil well drilling. Mounted on 5 ton Bulldog Mack truck. Both drill and truck in good condition. Complete with these tools: 1 — 4½"x20' stem, 1 — 5"x20' bailer, circle jack, 2 set-up jacks, 2—6¼" bits, 2—8" bits. 1—set jars. Machine now on deep well 1600 foot depth. Everything ready to go on present well completion. Price $7400. Box 192

BUSINESS FOR SALE

Well established well drilling and pump business located in northeastern Illinois. Two wood-frame truck mounted drilling machines and one all steel truck mounted machine. Several strings of tools, bailers, fishing tools, etc. Three Ford trucks, all equipment in good condition. Also an inventory of saleable merchandise of approximately $6000. Price $1500 cash. If interested write for details. P. O. Box 82, Barrington, Illinois.

DRILLS FOR SALE

Bucyrus - Erie 21-W drill. Late model, mounted on 1942 Chevrolet 4 x 4. Motors in A-1 condition, good tires on truck. Complete with swivel socket, 4" x 20' stem, three 5⅝" bits, set tool wrenches. bar and chain tool tightener, derrick tool guide, ball bearing equipped fan blower and 500 foot lines. Can be seen in operation any time. Price $4000 cash. Orlie Young. Crossville, Tenn.

DRILLS FOR SALE

Bucyrus-Erie 33-W semi-mounted drill with 1000 ft. of new cable. String of new tools and about 1000 ft. casing. W. A. Kaderavek, Marengo, Iowa. Phone 487.

Bucyrus-Erie 33-W equipped with LeRoi four cylinder gasoline engine. Mounted on 1936 Ford V-8 truck, Telescopic derrick with rubber shock absorber. Good condition. Located in northern Indiana. Box 201.

MISC. FOR SALE

Set of 6" diameter drill tools 3¼ x 4¼ - 7 joints. Box 204

HELP WANTED

Driller to work in southeastern New York. New machines, good working conditions. Excellent wages. Box 207

WIT BITS

The new florist's assistant picked up the phone and listened attentively as he heard the following order: "The ribbon must be extra wide with 'Rest In Peace' on both sides and if there is room 'We Shall Meet in Heaven'."

There was a sensation when the flowers arrived at the funeral. True, the ribbon was extra wide, but it bore the inscription—"Rest In Peace On Both Sdes, And If There Is Room, We Shall Meet In Heaven."

City Guide: "And that's a skyscraper."

Farmer: "What do ye know. I'd like to see 'em work."

The teacher had written 79.5 on the blackboard, and to show the effect of multiplying by ten, had rubbed out the decimal point.

"Now, Alfred," she said, "where is the decimal point?"

"On the duster," replied Alfred with a triumphant smile.

Applicant: "Have you an opening for me?"

Personnel Mgr.: "Yes, but don't slam it on the way out."

A stingy rich man was lying on his death bed. He called his chauffer, who had been in his service for years, and said: "Ah, Thomas, I am going on a long and rugged journey, worse than you ever drove me."

"Well, sir," consoled Thomas, "there's one comfort—the road will be down hill all the way and you won't need any gasoline."

The snow was falling softly. The drilling contractor waxed poetic while driving his stenographer home at the day's end. "Winter draws on," he said.

"What business of yours is it what I'm wearing," she snapped.

She: "Sir, I'll have you know I am marrying a driller and a gentleman."

He: "You can't do that—it's bigamy."

Temperance Orator: "There are some who merely advocate temperance. But what, I ask, is the real drink question?"

Voice from back row: "What'll you have?"

Use Acme Cable Tools

TRUSTWORTHY SINCE 1900

THREE POTENT FACTORS

that make Acme Drilling Bits the No. 1 choice of more cable tool drillers, as time marches on, are: Premium-grade steel; CORRECT heat-treatment, and a 48-year backlog of specialized craftsmanship.

1 — All billets MUST meet our rigid analyses specifications. Not over a 5-point range (instead of mills' usual 10) is ever allowed. Such exactness cost us EXTRA. But it's your greater protection, down hole, we strive for.

2 — Uniform, maximum toughness assured by electrically controlled, automatic shut-off furnaces. Thus, EXACT temperatures insure proper heat-treatment — correct forgings. No "guess and by-gosh" at Acme!

3 — An "exactly right" Bit — according to Acme's "Old School" rule — is designed for perfectly balanced proportions. And if it takes EXTRA pains and time to turn a trouble-free joint, it pays off, we find, in customer Good Will.

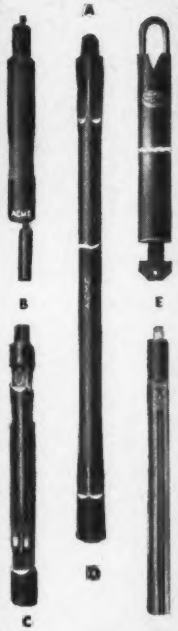
See panel (right) for other Acme Drilling Tools — for that EXTRA service you prefer.

End View

Fig. 108 (left) Acme Drilling Bit

For complete information on Acme Trustworthy Tools, write TODAY for new Catalog — expressly designed for Water Well Drillers.

More of EVERYTHING You Need in an Acme String . . .



A—Wire Line Clamp, 12"
B—Prosser Swivel Socket
C—Drilling Jar
D—Drilling Stem
E—Bailer
F—Drilling Bit

Acme Fishing Tool Co.

PARKERSBURG, W. VA.

ACME DRILLING & FISHING TOOLS Since 1900

FOR MONTH OF

February 1948

Brine Contamination of Fresh Waters . . . 4
The water well driller is in a strategic position to stress water conservation and point out the danger of allowing fresh water supplies to be contaminated by the careless handling of industrial wastes.

•

When The Going Gets Tough—Call Ames 7
It takes a lot of sweat, determination, and know-how to become a first class driller—and this is just the formula that the Hoeg & Ames Drilling Company of Lincoln, Iowa, have followed for over 40 years in becoming outstanding drilling operators in their area.

•

Editorial Page 10
Monthly water report; Obituary.

•

News of the Month 12
Association reports for Iowa, Texas, Missouri, and Minnesota; South Carolina water survey, and news of the industry.

•

Mail Bag 16
Water Wells Develop Crude Oil Taste

•

Bargain Counter 25

•

Wit Bits 26

ADVERTISERS IN THIS ISSUE

Acme Fishing Tool Co. 27
Amer. St'l & Wire . . 17
Baker Mfg. Co. . . . 13
Bucyrus-Erie Co. . . . . 2, 18 & 24
A. D. Cook, Inc. . . 22
Columbia Steel Co. . 17
Driller Records 16
Deming Co. 11
Fitler Co., E. H. . . . 14
Jacuzzi Bros. Mfg. . 3
Jensen Bros. Mfg. . . 15
Macwhyte Co. 21
F. E. Myers & Bros. . 20
Peerless Pump Div. . 23
Red Jacket Pump Co. 19
U. S. Steel Corp. . . . 17

DRILLER

A journal for water well drillers

SO. MILWAUKEE WIS. U.S.A.

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